

Study Guide

For use with pages 230–235

GOAL Add and subtract unlike fractions.**EXAMPLE 1** Adding and Subtracting Fractions

- a. $\frac{17}{45} + \frac{3}{5} = \frac{17}{45} + \frac{27}{45}$ Write $\frac{3}{5}$ using LCD.
 $= \frac{17 + 27}{45}$ Write sum of numerators over denominator.
 $= \frac{44}{45}$ Add.
- b. $\frac{11}{15} - \frac{5}{12} = \frac{44}{60} - \frac{25}{60}$ Write fractions using LCD.
 $= \frac{44 - 25}{60}$ Write difference of numerators over denominator.
 $= \frac{19}{60}$ Subtract.

Exercises for Example 1

Find the sum or difference.

1. $\frac{5}{11} + \frac{1}{4}$ 2. $\frac{7}{8} - \frac{17}{24}$
 3. $\frac{5}{16} - \left(-\frac{7}{12}\right)$ 4. $-\frac{19}{36} + \frac{41}{48}$

EXAMPLE 2 Adding Mixed Numbers

- $3\frac{5}{6} + 1\frac{7}{9} = \frac{23}{6} + \frac{16}{9}$ Write mixed numbers as improper fractions.
 $= \frac{69}{18} + \frac{32}{18}$ Write fractions using LCD.
 $= \frac{69 + 32}{18}$ Write sum of numerators over denominator.
 $= \frac{101}{18} = 5\frac{11}{18}$ Add. Then write fraction as a mixed number.

Exercises for Example 2

Find the sum.

5. $5\frac{1}{4} + 3\frac{1}{6}$ 6. $-4\frac{7}{15} + 5\frac{1}{5}$
 7. $-2\frac{6}{13} + \left(-6\frac{3}{5}\right)$ 8. $8\frac{11}{12} + 4\frac{9}{10}$

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EXAMPLE 3 Subtracting Mixed Numbers

$$7\frac{5}{9} - 9\frac{1}{4} = \frac{68}{9} - \frac{37}{4}$$

Write mixed numbers as improper fractions.

$$= \frac{272}{36} - \frac{333}{36}$$

Write fractions using LCD.

$$= \frac{272 - 333}{36}$$

Write difference of numerators over denominator.

$$= \frac{-61}{36}$$

Subtract.

$$= -1\frac{25}{36}$$

Write fraction as a mixed number.

Exercises for Example 3

Find the difference.

9. $7\frac{3}{4} - 2\frac{7}{12}$

10. $-9\frac{2}{3} - 2\frac{10}{11}$

11. $3\frac{13}{20} - \left(-4\frac{11}{16}\right)$

12. $-8\frac{3}{7} - \left(-7\frac{2}{9}\right)$

EXAMPLE 4 Simplifying an ExpressionSimplify the expression $\frac{2d}{5} + \frac{d}{4}$.

$$\frac{2d}{5} + \frac{d}{4} = \left(\frac{2d}{5} \cdot \frac{4}{4}\right) + \left(\frac{d}{4} \cdot \frac{5}{5}\right)$$

Write fractions using LCD.

$$= \frac{8d}{20} + \frac{5d}{20}$$

Multiply.

$$= \frac{8d + 5d}{20}$$

Write sum of numerators over denominator.

$$= \frac{13d}{20}$$

Add.

Exercises for Example 4

Simplify the expression.

13. $\frac{d}{4} - \frac{d}{12}$

14. $\frac{5a}{7} - \left(-\frac{a}{14}\right)$

15. $\frac{3x}{8} + \frac{7x}{12}$

16. $-\frac{a}{6} + \frac{a}{18}$